



**Smart
LOAD**

®

MARINE LOADBANKS

Unique generator load management system specifically engineered for Super Yachts.



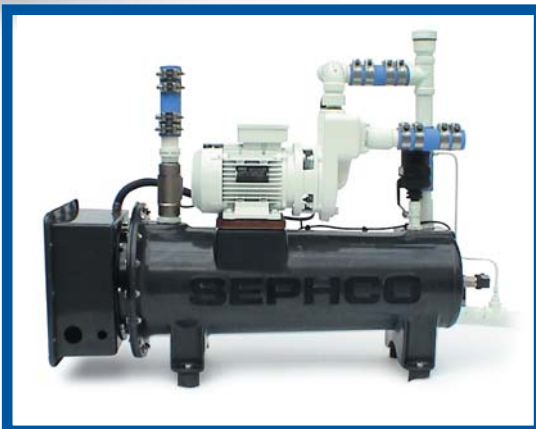
Smartload® is the most complete marine generator load control system available in the world today

Benefits

- Reduced discharge of exhaust gases and pollutants.
- Increased engine life.
- Improved life and performance of catalytic converters and wet-exhaust systems, by automatically loading the engine to maintain optimum combustion, gas temperature and gas velocity.
- Cleaner above-water exhaust gas discharge.
- Reduced operating and maintenance costs.

by





Marine load banks apply an automatic, supplementary load on diesel generating sets, to ensure the engine is always sufficiently loaded, to perform at the manufacturer's optimum efficiency and specification.

The power generation on a vessel needs to have capacity to meet all the load requirements on demand. In most cases, the vessel's load is far less than the minimum required, as specified by the manufacturer.

Diesel generators are designed for peak performance, to run within a load range parameter however; this is not always the real time situation. Diesel engines need to work!

When diesel engines are under-loaded, efficiency is compromised due to incomplete fuel combustion. This causes premature engine wear, loss of lubrication, cylinder bore glazing, slobbering and increased emissions, further compounding the problem by affecting associated exhaust treatment systems and running costs.

Under-loading will result in premature engine rebuilds and replacement. Engines not loaded within the manufactures specifications can have their service life decreased by up to ten times. The cost of one rebuild or replacement can be multiple times the cost of a Smartload® unit.

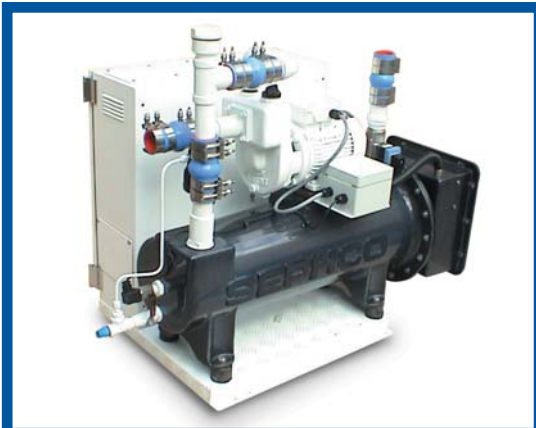
Sephco Smartloads, automatically applies a load to the generating system, to maintain the required minimum load (generally about 65%). The advanced operating system does not interfere with the general operation of the vessel and interfaces easily with all on-board management systems.

On-board power design are complex and critical in operation. Engineering decisions determine how efficient the vessel functions as well as the cost of operating and maintenance. An important area is to make provision for a potentially under-loaded engine during operational periods.

Sephco® Smartload® is an important component of the system. To assist engineers and designers, we recommend reading the "Exhausting Story" on our website.

Sephco has been manufacturing load banks for over 25 years and have continually set the benchmark for generator load protection. Sephco has pioneered the Processor Management, Automatic Loading system. There is no other pier in the function, design, performance and control of generator loading systems.

Over the past five years, Sephco has continued its commitment to improved design, by developing state-of-the-art control and materials, to further enhance the Marine product line, thus meeting every known demand with on-board power generating systems, associated with the Super and Mega Yacht industry. The product has undergone real-time testing and endurance for thousands of hours, including destruction tests, addressing every possible marine requirement and condition.



System description

The marine Smartload® is a water-cooled heat exchanger. At its heart is a seawater cooled carbon fibre composite vessel, with resistors specifically developed to withstand the rigours of salt-water operation.

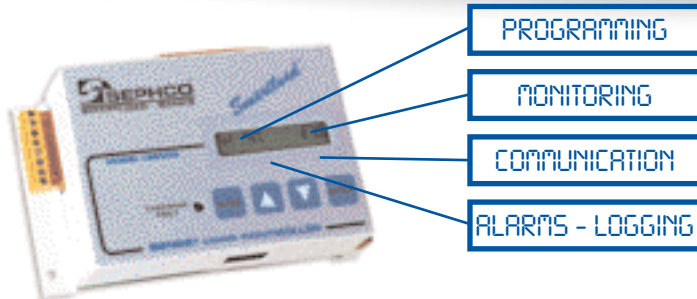
The brains of the Smartload® is the latest generation of Auto Load Shedding control, which has been designed to suit the special requirements of marine applications, including loading of multiple generating sets. The complete package has been solely developed as a marine unit.



Features

The system has the following features and inclusions

- Carbon composite heat exchanger with Copper Nickel fittings
- Smartload® automatic load control system
- Multiple genset control and load operation
- Water flow control
- Over pressure control
- Over temperature control
- Auto air venting control
- Self-priming marine pump with overload protection.



Control

Installation of an appropriately sized LSMC type load bank, connected in parallel with the boat's load, ensures smooth running and operation of the genset, regardless of the on-board load condition. LSMC series load banks incorporate the SmartLoad® LSM8000 load monitoring, microprocessor controller. The controller monitors the boat's load via a CT located on the genset alternator bus-bar and compares the load against a preset value determined for the size of the genset.

As the boat's load falls below the minimum level appropriate for the genset, step by step load stages are switched in from the load bank, to supplement the boat's load.

The linear hysteresis of the control ensures fast response and conditions the boat's load accordingly by adding an appropriate load value from the load bank. Upon recovery of the boat's load, the processor sheds load stages from the load bank to correspond with the controller's set value.

The control uses the latest generation CMOS microprocessor with EEPROM memory for system backup of operational parameters during power loss. Advanced software programming provides a level of control not possible with any current sensing device or PLC.

Programming the LSM8000 is simple. By following the screen prompts, the operator can simply enter the data to suit the application such as C.T. ratio, generator rating, delay ON time, load RESPONSE time and percentage load requirement.

The LSMC Load Bank range is supplied with the LSM8000 controller and switchgear. LSMC Load Banks are supplied complete with a control panel housing the LSM8000 controller, associated switchgear and protection devices.



Additional Control Functions

Safety

The LSM8000 monitors water temperature, system flow and operating pressure. In the event of over-temperature, a pump cool-down period is initiated prior to shut down.

In the event of a low flow condition, the control logic shuts down all loads and continues monitoring. If the flow recovers within the pre-set time, the unit is reinstated to normal operation. An over-pressure condition will immediately initiate an emergency stop.

The display panel will indicate a "fault-cause" message visible through the window in the door.

Display Panel indicating functions:

- Elapsed hours.
- % load or kW setting on genset.
- Text messages indicating the type of fault condition
- Interlock safety devices, condition status
- Data entry display of setup parameters

Enable/Disable Input

A voltage free input is provided for external control and system interface.

Alarm

- Voltage free output to indicate a fault condition.

Communication

Direct Connection - USB Socket. Vessel Management System Connection - MODBUS RTU protocol. RS485 interface, 2 wire with signal ground and shield.

Alarm - Option

Data output for vessel management system interface. Signal provides alarm status of:

- Coolant high temperature
- Resistor high temperature
- Over pressure
- Low water flow
- Pump overload or failure

Monitoring - Option

Data output for vessel management system interface. Signal provides status indication of:

- kW load on system
- % setting of engine load
- Water flow rate
- Running hours.

Dual Menu Operation - Upgrade Option

Upgrading the Smartload® controller to a dual menu operation may be necessary when generators are combined or in sync, or when generators on vessels are of different capacities. The upgrade will provide access to a second operational menu, activated by a remote signal. CT locations and Dual Program technical support is available on our website. For further assistance, consult the factory regarding design of your system.

LSMC Standard Models

Available in 208V, 240V, 380V, 400V, 415V, 440V, 480V

SIZE	MODEL No
20kW	LSMC1-20
30kW	LSMC1-30
40kW	LSMC1-40
50kW	LSMC1-50
60kW	LSMC1-60
75kW	LSMC2-75
100kW	LSMC3-100

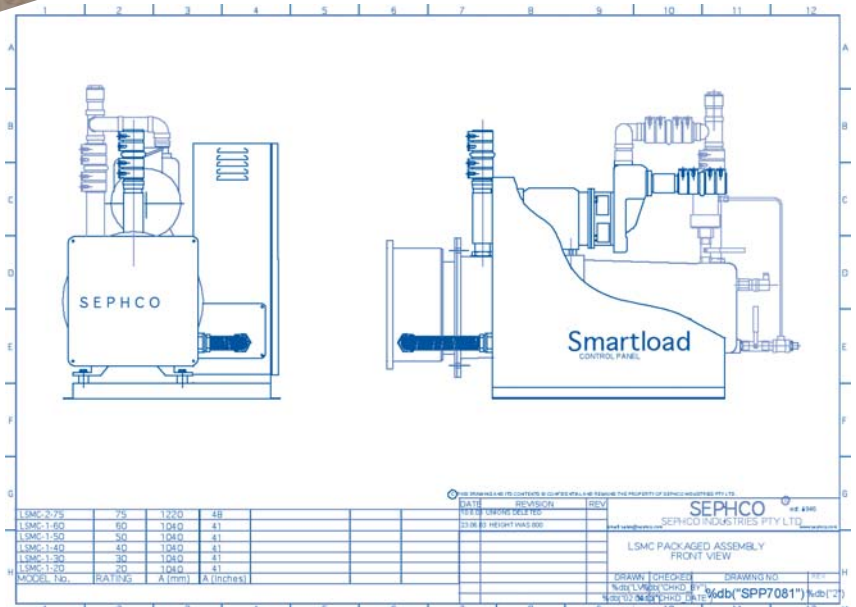


Maintenance

Little maintenance is required. Once installed, years of trouble-free operation can be expected. Periodic service requires flushing the system with a de-scaling solution, specially developed for the application. The Smartload® controller incorporates an operational hour display, to indicate service intervals.

Specifications and Technical Data

Complete detailed specifications are available on our website:
www.marineloadbanks.com



Installation

The system is supplied as a package unit, which requires only connection to seawater supply and discharge. Electrical installation involves a three-phase connection to the main bus, and installation of a current transformer/s (not supplied).

Where space is restricted, the design allows for separation of the control enclosure and circulation pump.

